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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/501,713 | 07/19/2004 | Volker Hennige | 254659US0XPCT | 4451 |
| 22850 7590 05/18/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER COLE, ELIZABETH M | |
| | | | ART UNIT 1794 | PAPER NUMBER |
| | | | NOTIFICATION DATE 05/18/2009 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/501,713 | Applicant(s) HENNIGE ET AL. | |
| | Examiner Elizabeth M. Cole | Art Unit 1794 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/12/09.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,14-22,24-28,30-38,40 and 46-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14-22,24-28,30-38,40 and 46-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-36 of copending Application No. 10/504,144, in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclosed the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving

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bonding between resins and metal oxides along with the silane coupling agents used in Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the composition of US '144, in order to improve bonding between the inorganic coating and the substrate.

3. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/524,143, in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclosed the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving bonding between resins and metal oxides along with the silane coupling agents used in Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the

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composition of US '143, in order to improve bonding between the inorganic coating and the substrate.

5. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/524,669 in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclose the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving bonding between resins and metal oxides along with the silane coupling agents used in Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the composition of US '669, in order to improve bonding between the inorganic coating and the substrate.

7. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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8. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of copending Application No. 10/519,097 in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclose the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving bonding between resins and metal oxides along with the silane coupling agents used in Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the composition of US '097, in order to improve bonding between the inorganic coating and the substrate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-29 of copending Application No. 10/575,268 in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555. Although the conflicting claims

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are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclosed the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving bonding between resins and metal oxides along with the silane coupling agents used in Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the composition of US '268, in order to improve bonding between the inorganic coating and the substrate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of copending Application No. 10/575,759 in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555 Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further

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comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclosed the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving bonding between resins and metal oxides along with the silane coupling agents used in Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the composition of US '759, in order to improve bonding between the inorganic coating and the substrate.

11. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 22-42 of copending Application No. 10/575,734 in view of Penth et al, U.S. Patent No. 6,309,545 and Bishop, U.S. Patent No. 5,639,555. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Penth discloses a fibrous substrate coated with a permeable inorganic coating wherein the coating further comprises a silane coupling agent, (see examples 1.8 and 1.9), but does not disclosed the claimed silane coupling agent. Bishop teaches that the claimed silane coupling agents are known in the art to be useful as silane coupling agents for use in improving bonding between resins and metal oxides along with the silane coupling agents used in

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Penth. See col. 2, lines 65 - col 4, line 39. Therefore, it would have been obvious to have incorporated a silane coupling agent as taught by Penth and Bishop in the composition of US '734, in order to improve bonding between the inorganic coating and the substrate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1, 3-12, 14-22, 24-28, 30-31, 33, 40, 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Penth et al, U.S. Patent No. 6,309,545 in view of Bishop, U.S. Patent No. 5,639,555. Penth discloses a permeable composite material comprising a fibrous substrate which may be formed from natural or synthetic fibers having a coating disposed thereon. See col. 3, lines 61- col. 4, line 10. The synthetic fibers can be polyamide. The total thickness of the composite material may be 5-150 micrometers. See claim 62. The fibrous substrate can comprise pores or openings having a size of 0.02-500 micrometers which correspond to a minimum value of 20 nm which is within the claimed range. See col. 3, lines 39-60. The coating can comprise metal oxides including those claimed. See col. 6, lines 21-43. The coating can be applied by stamping, pressing, rolling, blade or a brushing, dipping, spraying or pouring. See col. 5, lines 32-36. The inorganic material can comprise a sol comprising the

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metalloid oxide sol. See col. 5, lines 48-53. The membrane can be bent to a radius of 1 mm without breaking. See col. 2, lines 55-60. The sols are obtained by hydrolyzing at least one metallic compound, at least one metalloid compound or at least one composition metallic compound. It is advantageous to carry out the hydrolysis of the compounds to hydrolyzed with at least half the mol. ratio water, water vapor or ice in relation to the hydrolysable group of the hydrolysable compound. The hydrolyzed compound can be treated with at least one organic or inorganic acid. Preferably the percentage by mass of the suspended component should be 0.1 to 500 times the hydrolyzed compound used. The suspension consisting of sol and compounds to be suspended preferably has a ratio of sol to compounds to be suspended of 0.1: 100 to 100: 0.1. See col. 5, line 54 0 col. 6, line 65. Penth teaches including known silane coupling agents such as methyl triethoxysilane and tetraethyloxysilane in the sol, (see examples 1.8 and 1.9) but does not teach the particularly claimed glycidyloxy functionalized silane or methacryloxy-functionalized silane. Bishop teaches that silane coupling agents are known in the art as providing improved bonding between metal oxides and resins. See col. 1, lines 18-26. Bishop teaches that the claimed silane coupling agents are known and are equivalent to those claimed by Penth. See col. 2, lines 31 - col. 4, line 39. Therefore, it would have been obvious to one of ordinary skill in the art to have employed other known and useful silane coupling agents as taught by Bishop instead of those employed in Penth, in view of the teaching of Bishop that such coupling agents improve bonding between ceramics and resins and that the claimed

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coupling agents were recognized as equivalent, known and useful coupling agents to those employed in examples 1.8 and 1.9 of Penth.

15. Penth differs from the claimed invention because it does not disclose the claimed porosity or fiber diameters. However, since Penth teaches employing a porous substrate, and teaches that the porosity of the material can be controlled, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the particular porosity and pore size which produced a membrane having the desired porosity. Since the size of the fibers would be related to the size of the pores, it further would have been obvious to have selected the fiber size through the process of routine experimentation which produced a material having the desired porosity.

16. Claims 32,34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Penth in view of Bishop as applied to claims above, and further in view of Sassa et al, U.S. patent No. 5,324,579. Penth differs from the claimed invention because while Penth teaches that the fibers may be "plastic" fibers generally, and teaches polyamide fibers specifically, Penth does not disclose the other particularly claimed fibers. Sassa et al teaches that fibers such as PTFE, may be combined with other types of synthetic plastic fibers including polyesters, polyamide, polyolefins, polyimide and polyacrylonitrile fibers in order to form substrates which are used to form filter materials. See col. 5, line 56-col. 6, line 56. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the polymeric fiber materials disclosed in Sassa in the invention of Penth, motivated by the teaching of Sassa that

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the other polymeric fibers were recognized in the art as equivalent to the polyamide fibers specifically taught by Penth and also because of the art recognized suitability of such fibers for the purpose of making substrates for filtration.

17. Applicant's arguments filed 2/12/09 have been fully considered but they are not persuasive. Applicant argues that Bishop does not teach that the claimed coupling agents promote adhesion between ceramics and thermoplastic resins but only between ceramics and thermosetting resins. However, Penth already teaches the use of silane coupling agents in order to improve adhesion between thermoplastic resins and ceramics. Bishop teaches various other known silane coupling agents which include those which are employed in Penth and which can be used as adhesion promoters. Therefore, the person of ordinary skill in this art would have had a reasonable expectation that these other silane coupling agents could have been used to promote adhesion between thermoplastic resins and ceramic materials. It is noted required that the person of ordinary skill have a certainty of success, but only a reasonable expectation. The fact that Penth already taught the use of silane coupling agents as adhesion promoters in combination with the fact that Bishop lists both those silane coupling agents used in Penth as well as the claimed silane coupling agents for use as adhesion promoters would lead the person of ordinary skill in the art to have a reasonable expectation that the claimed silane coupling agents would also function to promote adhesion between thermoplastic resins and ceramics.

18. With regard to the previously cited art rejections, please see paragraph 16 of the action mailed 6/3/08 for answers to previous arguments that the references taught away

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from the use of the particularly claimed silane coupling agents. It is also noted that those references are not employed in the instant rejection.

19. Applicant argues that there is nothing on the record to establish that fiber size is related to porosity. However, it is well known that an important factor in determining fabric porosity is fiber diameter, since the fabric porosity will be greater where the fibers have a greater diameter and lower when the fibers have a small diameter, since fabric porosity and fiber diameter are related, i.e., smaller fibers produce smaller pores and a less open fabric, while larger fibers produce larger pores and a more open fabric. See, for example, US 5,039,431 at col. 3, lines 44-60.

20. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case, the rejection which states that the use of an art recognized equivalent to form the fibers would have been obvious to one of ordinary skill in the art does not involve impermissible hindsight.

21. With regard to the obviousness-type double patenting rejections, the arguments are the same as those above with regard to the combination of Penth and Bishop.

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22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth M. Cole whose telephone number is (571) 272-1475. The examiner may be reached between 6:30 AM and 6:00 PM Monday through Wednesday, and 6:30 AM and 2 PM on Thursday.

The examiner's supervisor Rena Dye may be reached at (571) 272-3186.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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The fax number for all official faxes is (571) 273-8300.

/Elizabeth M. Cole/
Primary Examiner, Art Unit 1794

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